

Unit 5: Biological Evolution: Unity and Diversity

Content Area: **Science**
Course(s):
Time Period: **Generic Time Period**
Length: **3 weeks**
Status: **Published**

Disciplinary Core Ideas

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- [When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. \(secondary to 3-LS4-4\)](#)

LS4.A: Evidence of Common Ancestry and Diversity

- [Some kinds of plants and animals that once lived on Earth are no longer found anywhere. \(Note: moved from K-2\) \(3-LS4-1\)](#)
- [Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. \(3-LS4-1\)](#)

LS4.B: Natural Selection

- [Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. \(3-LS4-2\)](#)

LS4.C: Adaptation

- [For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. \(3-LS4-3\)](#)

LS4.D: Biodiversity and Humans

- [Populations live in a variety of habitats, and change in those habitats affects the organisms living there. \(3-LS4-4\)](#)

LA.3.W.3.1

Write opinion pieces on topics or texts, supporting a point of view with reasons.

MA.3.3.MD.B.3

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.

LA.3.SL.3.4

Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

MA.3.3.MD.B.4

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

LA.3.W.3.2

Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

3-LS4

Biological Evolution: Unity and Diversity

3-LS4-1

Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

3-LS4-2	Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
3-LS4-3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
LA.3.RI.3.1	Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
LA.3.RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.
LA.3.RI.3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
LA.3.W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

Essential Questions

Essential Unit Questions:

What do fossils tell us about the organisms and the environments in which they lived?

Objectives:

Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago

Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Concepts that will be taught:

- Observable phenomena exist from very short to very long periods of time.
- Science assumes consistent patterns in natural systems.
- Some kinds of plants and animals that once lived on Earth are no longer found anywhere.
- Fossils provide evidence about the types of organisms that lived long ago, and also about the nature of their environments.
- A system can be described in terms of its components and their interactions.
- People's needs and wants change over time, as do their demands for new and improved technologies.
- Populations live in a variety of habitats, and change in those habitats affects the organisms living there.
- When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, others move into the transformed environment, and some die.
- Possible solutions to a problem are limited by available materials and resources (constraints).
- The success of a designed solution is determined by considering the desired features of a solution (criteria).

Students will be able to:

- Observe that phenomena exist from very short to very long periods of time.
- Analyze and interpret data to make sense of phenomena using logical reasoning.
- Analyze and interpret data from fossils (e.g., type, size, distributions of fossil organisms) to provide evidence of the

organisms and the environments in which they lived long ago.

Examples of fossils and environments could include:

- Marine fossils found on dry land;
- Tropical plant fossils found in Arctic areas; or
- Fossils of extinct organisms.

- Describe a system in terms of its components and interactions.
- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of a problem.
- Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. (Assessment is limited to a single environmental change and does not include the greenhouse effect or climate change.)

Examples of environmental changes could include changes in

- Land characteristics,
- Water distribution,
- Temperature,
- Food
- Other organisms.

- Define a simple design problem that can be solved through the development of an object, tool, process, or system and that includes several criteria for success and constraints on materials, time, or cost.
- Define a simple design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time, or cost.

Activities

Read B 4-B11 B12-B23 in Textbook

Interpret Illustrations page. 69

Look at various fossils and make observations/ inferences about their environment

Mystery Science: Animals Through Time

Mystery #1: (Habitats and environmental change) In this Mystery, students will explore the idea that the rock under our feet sometimes contains fossils. These fossils reveal how habitats have changed through time.

Mystery #2: (Structures and adaptation, fossil evidence and classification) In this Mystery, students will learn how we can infer what the outside of an animal looked like, by using clues about their skeleton.

Mystery #3: (Fossil evidence and behavior) In this Mystery, students will learn how a dinosaur's footprints reveal how quickly a dinosaur was running.

Mystery #4: (Heredity, variation and selection) In this Mystery, students learn how people create new breeds of animals by mating (selecting) individuals with desirable traits

Mystery #5: (Heredity, variation and selection) In this Mystery, students will play a simulation based on a real-life experiment called “Lizard Island.” The simulation shows an example of how nature, not human beings, can slowly change the appearance of an animal using the process of selection.

Materials & Resources

www.mysteryscience.com

Fossils

Textbook

Brain pop Jr.

<https://jr.brainpop.com/science/land/fossils/>

Mystery #1:

Each student will need:

- a [What Habitat?](#)
- a pen or pencil

Mystery #2

Each student will need:

- a copy of the four-page handout, [What Do These Animals Eat?](#)
- a pen or pencil

Mystery #3

For the racetrack, you will need:

- [Print out the instructions and tracks for making the raceway](#)
- a clear area of floor that's at least 8 feet long and 4 feet wide
- masking tape
- a measuring tape or yardstick
- a pen that will write on masking tape

For the activity, each student will need:

- a copy of the [two-page student handout](#)
- a pen or pencil

- a ruler or straight edge

Mystery #4

Each student will need:

- a two-page [Designer Dogs worksheet](#)
- a pen or pencil

Mystery #5

How many students do you have?

Print these

- | | |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15 to 18 | <ul style="list-style-type: none">• 6 sets of Adopt A Lizard printouts (18 pages)• 9 sets of Baby Lizard pages (14 pages)• 1 copy per student of How Many Lizards printout• 7 sets of Adopt A Lizard printouts (21 pages) |
| 19 to 21 | <ul style="list-style-type: none">• 10 sets of Baby Lizard pages (14 pages)• 1 copy per student of How Many Lizards printout• 8 sets of Adopt A Lizard printouts (24 pages) |
| 22 to 24 | <ul style="list-style-type: none">• 10 sets of Baby Lizard pages (14 pages)• 1 copy per student of How Many Lizards printout• 9 sets of Adopt A Lizard printouts (27 pages) |
| 24 to 27 | <ul style="list-style-type: none">• 12 sets of Baby Lizard pages (14 pages)• 1 copy per student of How Many Lizards printout |

27 to 30

- 10 sets of [Adopt A Lizard printouts](#) (30 pages)
- 14 sets of [Baby Lizard pages](#) (14 pages)
- 1 copy per student of [How Many Lizards printout](#)
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Assessment

Brain pop quiz

Graphic organizer on ecosystems Page 58

Chapter 3 Test

Mystery Science assessment

Summative Assessment

Accommodations & Modifications

- Large print textbooks
- Additional time for assignments
- Review of directions
- Have student restate information
- Provision of notes or outlines
- Concrete examples
- Adaptive writing utensils
- Support auditory presentations with visuals
- Weekly home-school communication tools (notebook, daily log, phone calls or email messages)

- Space for movement or breaks
- Extra visual and verbal cues and prompts
- Books on tape
- Graphic organizers
- Quiet corner or room to calm down and relax when anxious
- Preferential seating
- Alteration of the classroom arrangement
- Reduction of distractions
- Answers to be dictated
- Hands-on activities
- Use of Manipulatives
- Follow a routine/schedule
- Alternate quiet and active time
- Teach time management skills
- Rest breaks
- Verbal and visual cues regarding directions and staying on task
- Daily check-in special education teacher
- Visual daily schedule
- Varied reinforcement procedures
- Immediate feedback
- Personalized examples